Notebook Series -- Notebooks by Experimenters Other Than Edison
Navy and Wartime Research Experiments
Submarine Detection Books
Notebook N-17-04-21

This notebook was used by E. Rowland Dawson during April-May 1917 for notes on experimental work done for the U.S. Navy. The experiments are related to those in the A. M. Kennedy Books, and some are continuations of experiments in Books #3 and #4 (N-17-04-05 and N-17-04-01), performed by Dawson while Kennedy was in Alabama. Included are notes on transmitters, receivers, and audions. Also included are experiments on funnels for direction finding. The notes indicate that Dawson reported to Edison through William H. Meadowcroft. The front cover is marked "Dawson." The pages are unnumbered. Approximately 40 pages have been used.

73498

Acme Co.,

MFG. STATIONERS,
96 JOHN ST.
AND
19 PLATT ST.
NEW YORK.

E R Dawson

Trans #1 = Small B♮ Bell
" #2 = Large E♭ "
" #3 = Break Wheel & cells + tele.
" #4 = Dinner Bell

Receiver #1 = Straight Bell Tele -
" #2 = Bell tel with tube
" #3 = Bell tel in brass case, attachable horn

Report to Mr Edison through Mr Meadowcroft
Expense accounts to R W Kellow
Charge acct 5005

To Charge batteries

BA = 16 amps 7 hours
B2 = 8 " 7 "
MO = 1 " 7 "

1.75 to 1.8 volts required per cell

CONNECTIONS TO SET UP 3 STAGE + 1 STAGE AUDIONS

To Rheostat at 999

To main battery assuming capacitance

Plug contacting 1st audion open plug jack. Pay no attention

Plug contacting 2nd audion open plug jack. Pay no attention

Plug contacting 3rd audion open plug jack. Pay no attention

Mounting. Pay no attention

Ground. Connect with ground wire at filament at left of base cap.

A battery = 9 volts. Connect to battery as indicated, also run wire from + to middle terminal of single stage audion, and − to A of single stage (left hand frame)

B battery = 126 volts. Connect with battery as indicated. Also run single lead wire from + to +B filamentset (middle hand one) of single stage audion.

To input of single stage audion.

"OUTPUT" of single stage audion goes to "SET" on one receiving resistance box. REC of this box connecting to SET on other box, REC on this box connecting to receiver.

Indicates lead covered wire.

To RHEO | INPUT | 1st SEC | 2nd SEC | 3rd SEC | MOUNTING | GROUND | A BAT | B BAT | OUTPUT

April 21/17

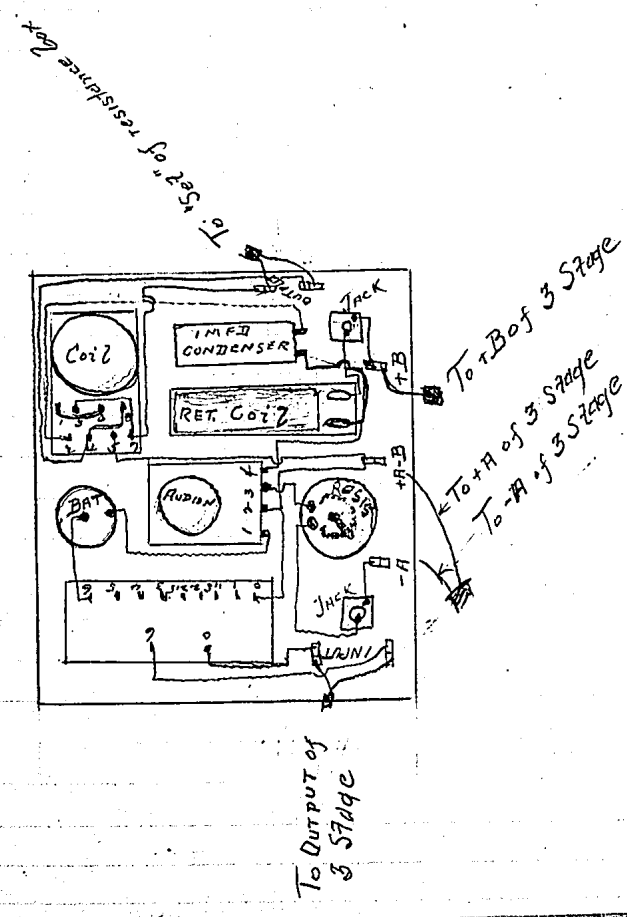
Kennedy left yesterday for Alabama
Telephoned Mr Meadowcraft's office
to that effect and said I would con-
tinue work here unless I received or-
ders to the contrary. Also wrote
him and Mr Edison to that effect
last night.

This morning, no orders having
been received, we started out. Fog
heavy but presumed it would
lift shortly which it did.

Meanwhile however, we had run
on bar near Island Beach, Tide
running out and to remain all
day waiting for it to come up
and float us off.

Got off at 4 30 but wind
had come up and conditions were
not good for making tests

Sketch of 1 Stage Audion with Connections



S.P.S.T. Trumbull switch left of 3 stage controls L+N resistance on outside of box. When switch is closed resistance is shunted across input. Close it when reading "Low" on left hand SPDT Trumbull switch

Two other Trumbull switches control the "10 lavite resistances mounted on 1 base". On low these resistances are in the circuit, on "High" these resistances are shorted out. As the switch to right is kept on high all the time, this switch and corresponding resistances could possibly be eliminated

Apr 22/17

Frank didn't show up. Went out with Andy alone.

Direction Test

Horn pointed direct at bell and at 90°

Receiver # 3 with funnel
Trans. # 4 (dinner bell)
Weather fine - Very little wind

100 yards

Pointed straight { Low 46
High 60

90° Couldn't hear

Wind had come up a trifle

Pointed straight (2nd reading) Couldn't hear

50 yards

Pointed straight - Can just hear on High at 0 intermittently

Tried Trans # 2 Could hear but weak

Thought it looked like bat. trouble
Tested with voltmeter. Appeared O.K.

Found ends of wire running to
under water phone, oxidized. Scraped
them. Improvement slight.

Examined all connections and
looked for water behind diaphragm
in phone. all O.K.

Next tried new A battery in spite
of voltmeter. Bell rang over side
which I could hardly hear before,
nearly broke my ear drums

Test to find value of funnel as direction finder.

Ringing bell from skiff and swinging boom on launch so that funnel points directly at bell, 90° from bell and directly away from bell (180°)

Transmitter #4 (dinner bell)
Receiver #3 with funnel
Weather conditions ideal

50 yards:

Straight	High 60
	Low 60
90°	High 42
	Low 20
180°	High 34
	Low 18

100 yards

Straight	High 44
	Low 32
90°	High 14
	Low 8
180°	High 24
	Low 12

Apparant discrepency between 90° and 180°. Made 90° second time and got

90 { High 36
Low 16

---

125 yards

Straight { High 30
Low 26

90° { High 28
Low 22

180° { * High ?
Low faintly at 2

* Noise has increased slightly

40 yards

Straight { High 60
Low 56

90° { High 46
Low 34

180° { High 44
Low 28

Test = Horn Off + Horn on

Trans # 4 : Reciver # 3
Weather Conditions ideal

HORN OFF

75 yards Can't Hear
50 " " "
But get trans. # 2 O.K.
40 yards Low 6 faintly
High ?

On a second reading at 40 yds could only get at zero on Low. ~~Do~~ 40 yards ~~is~~ apparently the limit with horn off.

HORN ON

40 yards
High 52
Low 40

75 yards
High 38
Low 34

175 yards
High ?
Low 6?

Noise greater now than in last experiment

3 15 PM

Direction test to verify previous.
Trans #4 Receiver #3 with horn

Weather Wind blowing in hard puffs. Looks like squall coming
Receiver Noisy

75 yards
High 28
Low Can't hear

Hear Bell #2 at 50

50 yards

Straight { High 46
Low 37

90° { High 22
Low 16

180° { High 6
Low ?

Noisy during all above readings. When puff of wind would come bell was lost entirely.

25 yards

Straight { High 60
Low 46

90° { High 30
Low 18 faint

180° { High 30
Low 8 *

Rudder hull - Very quiet

* Heard also a boat which I didn't see. On investigation saw tug about a mile across the bay.

Tried taking horn off again but didn't seem to make so much difference.

35 yards

Horn On

High	60
Low	60

Horn Off

High	60
Low	58

Began to rain and sky looks squally. Stopped at 30

Apr 21

Only one man on boat. Rain and NW wind. Worked on boat at pier in morning.

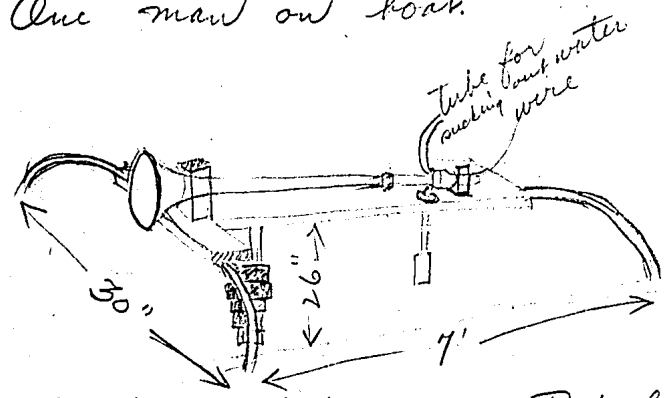
Connect lead wire to rubber in anticipation of using tripod wrapping connections with gutta percha, covering thickly with Chatterton compound and making all fast with Chatterton to tape covering end of phono, and wrapping outside with tape.

With cable on, audions very noisy incessant roar. Replaced cable and #3 with #2 and rubber covered wire. Everything OK. Decided to replace cable on #3 with rubber covered.
In removing Chatterton pulled loose Chatterton + tape holding old connections and broke short rubber covered wire off short

Couldn't fix myself so caught 6 o'clock train for Orange and got Taylor to fix. He made two small bushions and fitted them over ends sticking up, then soldered long wire into bushion. Covered with gutta percha, chatterton and tape

April 25

One man on boat.



Wood T with pipe legs. Rope fastened around both tripod and funnel leading to boat - 100 feet away.

Launched apparatus with boom as usual before using the above to see if things were working in good shape.

Then sank funnel and tripod. Things much quieter. Noise sounds deadened - more steady and solid.

Noise not annoying as it was before.
Resistance boxes (1 to 60 stuff) seemed to make less difference.
Hear tug clearer than ever before.

Sea rougher boat rocking — practically no difference

Sent skiff out, listening to it as far as I could hear on zero. Then signaled Andy to ring bell #2. Heard it easily at 60. So the bell is a bit easier to pick up than skiff.

Number of big gun shots at Proving Grounds makes little impression under the water.

Paddle wheel steamers appears to make noise — not a distinctive sound like tug, and very little of that.

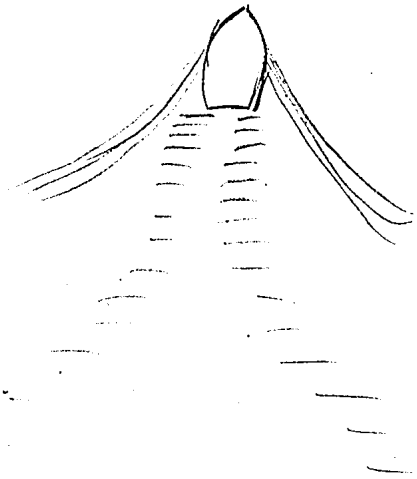
Patten and Albertina passed and could distinguish nothing but possibly an increase of noise when at the points where tug had been loudest.

When Patten passes, it took 5 minutes for swell to reach us and we were about 1500 yards from channel, Patten meanwhile had gotten a mile forward.

After 1st swell which made boat rock violently, there was lull then 5 separate sets of swells of 4 or 5 each. After this water was roughest than it was before boat had passed.

Andy says first swell was bow swell and the others stern swells. There are two distinct swells ac-

cording to him. One from bow which goes off side-ways and swells which follow the boat and travel in same direction.



He says he has known area where we were, to be disturbed an hour after steamers had passed. Imagine flats which are all around there, have lot to do with it

Tide also — They are greater in low tide

Apr 26

Hard rain all day. East wind. Did not go out. Only one man on boat

Apr 27

Sun is out but N.W. wind is strong

Will try it in the bay but am afraid will be too rough there. Second Man on boat
Jimmie on boat

Stopped at first buoy in river as weather was very threatening.
Test. To find value of extra heavy diaphragms.

Receiver # 7 Trans # 4
300 yards
Weather fair.

Something seems wrong with resistance boxes. Conducted these tests with boxes out relying on ear.

Reg. bell diaphragm
Hear only at intervals.
Knocks and frying in Rec.

A = .060 Iron. Heard noise like exhaust of gas boat. It slowed down and died away just as boat does when stopping. No boat in sight. After this pretty quiet and hear bell very distinctly

B = .040 Not as quiet as A about boat stopped but hear bell clearly

C = .032 Very little difference

D = .020 Hear bell but not as clearly. Noise very much greater.

Reg Bell (Repeat) Can't hear bell - Noise much louder

Took resistance boxes' covers off and cleaned them. Boxes now work OK and audions are much more noisy on low numbers but noise is cut out entirely at 40

Test to find if we hear propeller or engine of skiff. With funnel in air and skiff running up and down 40 yards away, get explosions of exhaust and noise. Not a musical sound. No rhythm except puff puff.

With funnel etc submerged get rythmical whurring sound that sounds like a propellar and think it is

1000 yds
Trans 2 Rec #3
with diaphragm A

Hear at 3 High
Can't hear on Low
Frying at times

Omit

500 yds
Low 1
High 4

Omit.
Neglected to suck water into funnel

Distance Test

Trans # 2
Receiver # 3 Diaphragm Iron A=.060

Weather – East wind – Long rolling swell which rocked boat considerably

Tunnel etc sunk on tripod

Anchored half way between bell bouy and Atlantic High Pier.

Audions very quiet and steady. Undoubtedly would have been big fuss if launched by boom with reg bell diaphragm.

400 yards

Low	30
High	46

700 yds

Low	32
High	52

1200 yds

Low	30
High	44

1800 yds

Low	16
High	32

2200 yds
High 38
Low 20

2800 yds
Low 18
High 38

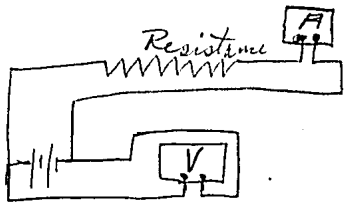
3000 yds
Low 14
High 38

3400 yds
Can't hear

Unable to account for discrepancies between 400 + 700 and 1800 + 2200
Caught propeller about 2000 yds as skiff was coming in

Practically no noise at all during about readings and launch was rocking considerably

To Test Batteries for Being Discharged



For B2 resistance should be such for 10 cells average should be about 8. Voltage 12

For B4's 16 Amps + 12 Volts

May 1/17

Kennedy in Orange.
Station – near old pier Sandy Hook

Test – To Find Value of Funnel as Direction Finder

Trans # 4
Rec. # 3 with funnel and tripod launched from boom.
Weather Good.

60 yards

Straight	High	60
	Low	60
90°	High	60
	Low	48

85 yards

Straight	High	60
	Low	50
90°	High	56
	Low	48

CCJ

Trans # 2

200 yards

Straight	High	60
	Low	42
90°	High	58
	Low	44

600 yards

Straight	High	54
	Low	40
80°	High	50
	Low	38

800 yards

Straight	High	38
	Low	20
70°	High	40
	Low	20

1000 yards

Straight	High	38
	Low	16
90°	High	34
	Low	12

1500 yards

Straight High 28
Low 12

90° High 38
Low 12

2000

Straight High 28
Low 6

90 High
Low Can't Hear

C65]

May 12/17

Test to Find Value of Mica Diaphragms with Soft iron Centres 1" in diameter

Tran # 4
Receiver # 2
Weather ~~Good~~
Distance 75 yards

Regular Bell Diaphragm
Low 36
High 52

.009 Mica Centre .004
Disc towards Magnet
~~Low~~ 34
High 46
Disc away from Magnet
High 54
Low 38

.005 Mica Centre .004
Disc Towards Magnets
Low 38
High 58

.004 Mica Centre .004
Disc away from Magnets
High 48
Low 34
Disc Towards Magnets
Low 28
High 46

Built Up .010 Mica. Two layers
.010 Mica and one of .013 Iron
Low 18 } Noisy
High 28

.004 Mica .013 Centre
Continuous Roar Can't Hear

.011 Mica .004 Centre
Disc away from Magnets
Can't Hear

Built Up .004 Mica, two
Layers .004 Mica One of .004
Iron
High 54
Low 36

A M Kennedy
1.01 Cloverdale Road
Montgomery Ala

NOTES

Tug seems louder running broadside to us than running stern on.

In breaking in operators it will be necessary to let each one listen to the sound actually made by a submarine so they can recognize the sound

Batteries ought to be connected with switch so they can be cut off when not in use